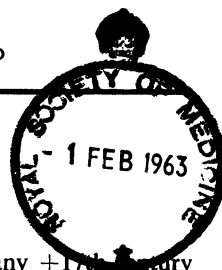


Section of the History of Medicine

President W H McMenemey MD

Meeting October 10 1962

Paper



China and the Origin of Examinations in Medicine

by Gwei-Djen Lu PhD
(Newnham College, Cambridge)
and Joseph Needham FRS
(Gonville & Caius College, Cambridge)

The origin of examinations in medical and surgical proficiency for the protection of the public from unskilled practitioners is a remarkably interesting subject. The germ of the idea goes back a very long way, for the beginnings of punishment for malpractice can be found in the famous law-code of Hammurabi (king of Babylon, —2003 to —1961). This continued in Achæmenid Persia where we find about the —5th century the Avestan surgeon being bound to practise first on three non-Mazdæans; then only, if successful, could he perform operations on Zoroastrians. But the science and art of medicine had to advance much further before we find any elaborate system of medical examinations. The evidence available (which we shall mention further in due course) indicates clearly that our European system of examinations derived from Arabic culture through the School of Salerno. The question arises, however,¹ whether the physicians of +10th century Baghdad could have been influenced by still earlier practices in regions farther East?

Chinese civilization constitutes a milieu of choice for seeking the origins of medical examinations in the modern sense. It is natural to suspect that the bureaucratic feudalism of ancient and mediæval China, so different from any kind of society known in the western regions of the Old World, originated examinations for medical qualification. There are striking parallels. When Bentley introduced written examinations in Cambridge in +1702, for the first time in Europe, he was certainly not unaware of the age-old Chinese civil service examinations, which had

been described in detail by many +17th century Jesuit writers in all the chief European languages. When Civil Service examinations were introduced in the nineteenth century in the West, the inspiration came again from the mandarin examinations conducted for two thousand years previously in China. And indeed, as soon as we begin to investigate the matter by a study of the original texts transmitted in great quantity from classical Chinese sources, we find that two things were inextricably combined there. First, there was a very early development of the idea of a State Medical Service, and secondly, the development, also very early, of the conception of an Imperial University for educating the Chinese equivalent of 'persons well qualified to serve God in Church and State'. Of course, as Chinese cosmic religion was theocratically atheist, so to say, and the State was not separate from the Church, this phrase needs to be taken with a grain of salt; nevertheless it expresses the situation well enough. In what follows we shall see that these two currents combined at a certain point to generate specifically medical colleges, and the introduction of qualifying examinations for medical students naturally followed. The problem is, exactly when?

Let us begin with the situation at the end of the Chou period, the time when the Warring States were engaged in their internecine strife before the foundation of the First Empire, the Chhin.¹ During the succeeding Han period, about the —2nd century, an important work was produced which stands as a monument of what people then thought was the ideal bureaucratic organization of society. This is the *Chou Li* (Record of the Institutions (lit. Rites) of the Chou Dynasty). A very interesting chapter in this classical text is concerned with what can only be described as a State Medical Service. Besides the Imperial Physicians (I Shih) and the Imperial Dieticians

¹The present paper originated as the response to a query of this kind raised in stimulating form by Mr Walter Pyke-Lees of the General Medical Council, to whom our best thanks are therefore owing

¹The system of romanization of Chinese adopted in this paper is that of Wade-Giles, with the substitution of an *h* for the aspirate apostrophe. The material which it presents will be included in our 'Science and Civilisation in China' (Cambridge) in course of publication, Vol. 6, where the characters for the Chinese names and terms quoted will appear in full, together with complete documentation. We abbreviate this reference hereafter as SCC

(Shih I), who were evidently connected intimately with the service of the emperor, there were also State Physicians (Chi I) charged with attending to the diseases of the mass of the people, and State Practitioners of External Medicine¹ (Yang I). There has always been some uncertainty as to how far the ideal organization sketched in the *Chou Li* was applicable to the country as a whole beyond the palace and the capital, but from the many other types of officials mentioned, such as Fumigators (Chu shih) and Sanitary Police (Chhü shih), it is clear that the beginnings of a State Medical and Public Health Service were envisaged.

Elsewhere the *Chou Li* in its lists of complements of official departments gives 2 Senior and 2 Junior Imperial Physicians with 2 Bursars (Fu), 2 Registrars (Shih) and 20 Apprentices or Disciples (Thu). This we should not overlook because it shows that at the very outset of the Chinese State Medical Administration, young aspirants to medical skill are found directly attached to the imperial organization.

After the first unification of the Chhin, the Han Empire lasted no less than four centuries, the Chhien Han from -202 to +9, and then the Hou Han from +25 to +220, paralleling Imperial Rome. Here we begin to see more clearly the entry of the distinction between two independent medical services, those of the palace and those of the nation.² For in the Former Han (-2nd cent.) we have the Thai I Chhêng-Ling, i.e. the Deputy Director of Medical Administration under the Chhang Fêng (Court of Imperial Sacrifices), and another Thai I Chhêng-Ling, Deputy Director of Medical Administration (Palace) under the Shao Fu (Directorate of Imperial Workshops). These are the first appearances of the expression Thai I Ling, which parallels the title of Astronomer Royal (Thai Shih Ling) and runs on down the centuries thenceforward. Special titles for the physicians in total attendance upon the emperor now appear, such as Shih I, equivalent to the later Yü I. In the Later Han period we find a number of officials listed in the Department of the Thai I Ling, for example, 2 Chief Pharmacists (Yao Chhêng), 2 Chief Prescribing Physicians also Deputy Directors (Fang Chhêng), 293 Junior Physicians (Yuan I) and 19 Administrative Personnel (Yuan Li). At this time also we begin to see the initiation of provincial medical organizations. Besides the officials at the capital there were

in each of the provinces a Superintendent of Medical Services (I Kung Chang). Many entries in the chapters on official organization for this period show that all the government offices at the capital and throughout the provinces had fixed complements of medical officers distributed among them. If we hear less of the position of the Apprentices or Disciples there can be no doubt that this system, together with at least the skeleton of the National Medical Administration, continued into the three States of the San Kuo period, a time of division which followed the united empire of the Han.

When we come to the second unification, that of the Chin dynasty (+265 to +420), we must pause to look at a parallel development, of the utmost importance for our story, which had long been going on. This was the constitution of the Imperial University. On the one hand the title of Po-Shih (doctor or professor) had appeared as early as the Chhin dynasty (-3rd century), and on the other hand the principle of examinations for scholarly competence had been brilliantly inaugurated by the emperor Han Wên Ti, who himself set the questions, in -165, probably the earliest occasion of the kind in any culture. Then in -124 Han Wu Ti, at the suggestion of Kungsun Hung and Tung Chung-Shü, had provided a body of these 'Erudite Gentlemen' (Po-Shih) with disciples (Ti-tzu) supported at government expense, thus establishing for the first time the Imperial University (Thai-Hsüeh). Starting with 50 students, it had grown steadily to no less than 3,000 by about -10; and in +4 Wang Mang convoked for it a grand congress of scholars from all over the empire to place the sciences and humanities upon a more definitive basis than before. The first emperor of the Later Han, Kuang Wu Ti, re-established the university in +29 after troublous times, and by the San Kuo period, when Wei Wên Ti moved it to Loyang in +224, Po-Shih had become an honoured rank in the bureaucratic hierarchy. Now in the newly unified empire of the Chin, between +275 and +278, Wu Ti reformed the university and divided it into two parts, the Kuo-Tzu Hsüeh for the sons of noble families and high officials, the Thai-Hsüeh for promising students of less distinguished stock.

In 1958 we had the pleasure of studying a magnificent stele which is still to be seen at the Kuan Kung temple at Loyang, dated +278. This inscription gives an account of the Imperial University of that time, with its 3,000 students, many from abroad, some from 'East of the Sea' (Liaotung) and some from 'beyond the shifting sands' (liu sha), i.e. Sinkiang. There is a long list of students' and professors' names, and a full translation of the inscription would be of much

¹This is a term (Wai Kho) special to Chinese medicine. Besides surgery (which was never as highly developed as in Indian culture) it comprised ophthalmic and orthopaedic surgery, dermatology (including diseases with prominent peripheral symptoms such as smallpox), and the treatment of all kinds of tumours and ulcers, war wounds and other traumatic lesions

²A parallel may be found in the two independent astronomical observatories maintained under certain dynasties (SCC, 3, 191)

interest. The student body was divided into freshmen (*Mên-jen*), those who had passed in one classic (*Ti-tzu*), those who had passed in two (*Pu-wên-hsüeh*), and those who had passed in three (*Thai-tzu shê-jen*). The final degree was that of *Lang-chung*, taken after about seven years, and eventually the candidate was ready to be gazetted to a government post. There was never any subsequent age when the Imperial University went altogether out of existence, though in times of disunion there were several institutions under competing dynasties, and it was only in periods of prosperity that the major institution could carry out its tasks to the full.

During the Chin the *Thai-Hsüeh* was strengthened by successive emperors, as for instance by *Yuan Ti* in +317 and later, when further chairs for the study of particular classics (including the *Chou Li*) were established; and then in the following century, under the Northern Wei, provincial colleges were set up in +466 in every commandery (*chün*).¹ The larger of these provincial colleges contained 2 professors (*Po-Shih*), 4 lecturers (*Chu-Chiao*) and 100 students (*Hsüeh-Sêng*). Towards the end of the Northern Wei, about +490, the emperor *Hsiao Wên Ti* changed the name of the Imperial University to *Kuo Tzu* (lit. Sons of the Nation), and then, under the dynasty of the Sui, about +610, the name was finally changed to the *Kuo Tzu Chien*. This designation lasted a very long time, down in fact to the end of the Empire in our own period. It is not too much to say that the universities of modern type existing all over contemporary China may trace their descent to the *Kuo Tzu Chien* of the Middle Ages, enlarged, modified and duplicated as it was under Western influence in the 19th century. But that is another story into which we cannot go here. The important point is that throughout the +1st millennium the conception of an institution of higher education within the framework of the national bureaucracy was thoroughly rooted in Chinese culture.

We must now retrace our steps to follow the developments in the national medical administration in the Chin period and subsequently. There was not much alteration. When we look at the Northern Wei records, we find little difference of importance until we suddenly come upon two striking new posts, *Thai I Po-Shih*, which we can only translate as *Regius Professor of Medicine*, and *Thai I Chu-Chiao*, again *Regius Lecturer in Medicine*. These appear as part of a great reorganization and settlement of the official hierarchy carried out by *Kao Tsu* (the emperor *Hsiao Wên Ti*) and most probably completed in

+493. The posts were of the lower 7th rank among the officials and lower 9th rank respectively, and they parallel a number of other didactic posts at the Imperial University not only in general education but also in astronomical and calendrical science, even including geographical communications. The picture is of such interest that it is worth tabulating:

Rank	Post
5 ii A	Regius Professor of Classics, College of Princes Libationer, Imp. Univ.
6 i B	Senior Regius Professor of Astronomy, Imp. Univ. Regius Professor of Classics, Imp. Univ.
6 i C	Regius Professor of Music, Imp. Coll. Music
7 i B	Student, College of Princes
7 ii C	Manager, Imp. Univ. Junior Regius Professor of Astronomy, Imp. Univ. Regius Professor of Divination, Imp. Univ. Manager, Imp. Coll. Music Regius Professor of Medicine, Imp. Coll. Med.
8 i B	Regius Lecturer in Classics, Imp. Univ.
9 i B	Regius Lecturer in Astronomy, Imp. Univ. Regius Lecturer in Medicine, Imp. Coll. Med.
9 ii B	Regius Professor of Geographical (Post-Station Service) Communications, Imp. Univ.

Thus the medical men were in dignified, if not the most exalted, company. How many of the high medical teaching posts there were in each category we do not know, but the idea spread rapidly.¹ The implications here are important. As we have seen, the *Thai-Hsüeh* of the Han was enlarged by the *Kuo-Tzu Hsüeh* of the Chin, and already by the +3rd century there had been classical examinations for nearly five hundred years. In the +4th, many new professorships had been established and the University enlarged in the +5th. Thus when the official dynastic history now speaks of high medical teaching officers, the implication is quite clear that there were not only lectures but also examinations for competence in medical knowledge. At this time we still do not have documentary evidence. But it comes soon.

The third great unification of China occurred in +581 when a single House, that of the Sui, took over again the dominance of the entire country. Apart from the usual administrative staff of the *Thai I Ling* we read that there were 2 Chief Pharmacists (*Chu Yao*) and 200 regular Physicians (*I Shih*), but also 2 Curators of Physick Gardens (*Yao-Yuan Shih*) where medicinal plants were systematically cultivated. On the educational side around +585 we find an expansion, in that 2 Professors of Medicine (*I Po-Shih*) are mentioned with 2 Lecturers (*Chu-Chiao*), also 2 Professors of Physiotherapy (*An-Mo Po-Shih*) and 2 Professors of Apotropaics (*Chu-Chin Po-*

¹Provincial academies and seminaries had first been established (or at any rate first recorded) by a decree of +3 issued under the emperor *Hsiao Ping Ti*

¹In +553 the Korean kingdom of *Paekche* sent an *I Po-Shih* named *Wang Yurung* to Japan to re-organize medical education there; his mission included two Masters of Drug Production *Pan Kyôngnye* and *Chông Yut'a*. By +702 it bore its full fruit, for in that year the emperor *Mommu* established an Imperial Medical College in Japan with five departments, and regular monthly and annual examinations

Shih). We know that the former must have taught medical gymnastics and massage among other things, while the latter represented a bureaucratic recognition of all the various incantatory and talismanic methods of driving away diseases which had existed among the Chinese people, as among all ancient nations, from high antiquity downwards. Veterinary science now also comes in because the Court of Imperial Equipages (Thai Phu) had among its staff 120 Teachers of Veterinary Science (Shou-I Po-Shih Yuan).

For the great Thang dynasty (+618 to +906) we have truly abundant information, and it is in the middle of the +8th century that we shall see the full development of medical examinations. We might first take a look at the Imperial University under the Thang. The Kuo Tzu Chien, as it was now called, seems to have consisted of two parts, one more socially exalted than the other (as indeed had been the case in the Northern Wei), perhaps something like 'Collegians' and 'Oppidans'. The 'Noblemen's' group consisted partly of relatives of the Imperial House itself, and partly of sons of officials of the 3rd rank and higher. These were Kuo-Tzu students, numbering 300. But besides them there were the ordinary students of the Imperial University, the Thai-Hsüeh students, numbering 500, sons or nephews of officials of the 5th rank and above; and in addition to these as many as 1,300 from all over the country, known as Ssu-Mên students. Five hundred of these came from the families of officials of the 7th rank and above, but 800 were essentially 'Scholars' or 'Sizars' drawn from the most intelligent and best families of the common people. Fifty places were reserved for students specializing in music and acoustics, and 30 for students of mathematics, all from commoners' families 'who understood these subjects'. Lastly there were 80 places specially reserved for metropolitan students, something rather like the scholarships tied to localities which existed till recently in Cambridge and Oxford colleges. The full complement of students was thus 2,100.

Turning to the National Medical Administration (Thai I Shu), we find that it was one of the eight administrations under the Thai Chhang Ssu (Court of Imperial Sacrifices). Below the two Directors, Senior and Junior (Thai I Ling) with their Deputy Directors (Thai I Chhêng), there were 4 Chief Medical Directors (I Chien) and 8 Assistant Medical Directors (I Chêng). Among the lesser staff of the Administration we hear of 2 Managers (Fu), 4 Secretaries (Shih), 8 Pharmacists (Chu Yao), 24 Apprentices in Materia Medica (Yao Thung), 2 Curators of Physick Gardens (Yao-Yuan Shih), 8 Apprentices in Physick Gardens (Yao-Yuan Sêng), and lastly 4 Clerks (Chang Ku). It is rather remarkable to

find that the rank and file of State physicians were still assessed bureaucratically according to the success of their medical practice, a procedure which, as we know, goes back to the end of the Chou period in China. The *Hsin Thang Shu* says:

'For the Physicians (I Shih), the Assistant Medical Directors (I Chêng) and the Practitioners (I Kung) their duties were clinical practice and the results were carefully recorded [by secretaries]. The data were analysed each year to examine their merits [and their salaries adjusted by the proportion of successful cures effected during the year]. Drugs and medicines were provided [by the Government] for the protection of the people's health and stored in the temples of the imperial ancestral tombs. [Within the palace] the Imperial Infirmary (Huan Fang) had its own medical storehouses, and the distribution of medicines was under the responsibility of the Superintendent (Chien-Mên). One of the I Shih, I Chêng or I Chien took turns to be on duty in this hospital. All the provincial regions which paid tax on medical produce had one Master of Drug Production (Tshai-Yao Shih). In and near the capital city the best fields were set apart for [experimental] gardens for the cultivation of medicinal herbs. Any ordinary commoner over 16 years of age could become an apprentice student in a Physick Garden (Yao-Yuan Sêng) for the cultivation of medicinal plants, and when their training was accomplished, they could become Curators of Physick Gardens (Yao-Yuan Shih). The duty of these men was to be able to recognize every item in Materia Medica and to be able to say where it came from and what part of the plant should be used. They were also charged with selecting the best material from what was sent in as payment of taxes, to be the portion of the government.'

What interests us here still more is the situation in the teaching field. We read again:

'The Thai I Ling were in charge of all methods used in therapeutic treatment, assisted by their Deputies. Under them too were the four [teaching] departments, namely those for the Physicians (I Shih), the Acupuncturists (Chen Shih), the Physiotherapists (An-Mo Shih) and the Apotropaists (Chou-Chin Shih). All these were instructed by Professors (Po-Shih) and obtained their official posts by passing examinations in the same manner as the students of the Imperial University (Kuo Tzu Chien).'

Here we have a quite specific statement about examinations which must refer to the middle decades of the +7th century. Each of the teaching divisions included 1 Professor of Medicine (I Po-Shih) and 1 Medical Lecturer (Chu-Chiao). The Thang dynastic histories give us a great deal more information about the four teaching departments of this Imperial College of Medicine and include data on the number of staff and students in each.

Thus the Department of General Medicine

comprised, besides the Professor (I Po-Shih) and his Lecturer, 20 physicians (I Shih), 100 practitioners (I Kung), 40 students (I Sêng) and 2 dispensers (Tien Yao). Only the Professor and Lecturer had rank in the official hierarchy. They taught the young students and practitioners from the already great medical literature, including the books of the *Pên Tshao* or pharmacopœia type, the sphymological classics such as the *Mo Ching*, and, of course, the fundamental classics such as the *Nei Ching* (*Su Wên* and *Ling Shu*), &c. The courses into which the lectures were divided have also come down to us. They were five in number: General Medicine (*thi liao*); Oncology (*chhuang chung*); Pædiatrics (*shao hsiao*); Otology, Ophthalmology, Stomatology and Dentistry (*erh mu khou chhih*) and Cupping (*chio fa*). As phlebotomy was never a characteristic procedure in Chinese medicine, it may be that this last term is a mistaken reading for *chiu fa*, moxibustion. Next, the Department of Acupuncture, besides the Professor (Chen Po-Shih) and his Lecturer (Chu-Chiao) contained 10 Acupuncturists (Chen Shih), 20 Acupuncture Practitioners (Chen Kung) and 20 Students (Chen Sêng). Here the students and young practitioners specialized on sphymology and acupuncture, learning the system of points on the surface of the body where 'needling' should take place in accordance with the signs indicated by the pulse and other diagnostic aids. All the mysteries of the different kinds of instruments, too, were opened to them. The other two Departments were somewhat less important. The Professor of Physiotherapy (An-Mo Po-Shih) had no Lecturer to second him, but his staff included 4 Physiotherapists (An-Mo Shih); these were in charge not only of medical gymnastics and massage but also dealt with traumatic injuries and fractures, having under them 16 Physiotherapeutic Practitioners (An-Mo Kung) and 15 Students (An-Mo Sêng). Lastly there was the Department of Apotropaics. The Professor (Chou-Chin Po-Shih) was seconded by 2 Apotropaists (Chou-Chin Shih) under whom were 8 Exorcists (Chou-Chin Kung) and 10 Students (Chou-Chin Sêng). This gives a grand total of 271 established posts and studentships in the Imperial College of Medicine, 162 in General Medicine, 52 in Acupuncture, 36 in Massage and Gymnastics and 21 in Apotropaics.

We get a vivid glimpse of the position regarding examinations in the year +758. In the *Thang Hui Yao* we read:

'On the 5th day of the second month of the 1st year of the Chhien-Yuan reign-period it was decreed that thenceforth those who qualified as medical officers, undergoing tests for their medical knowledge and skill, should receive the same treatment as those graduating with the Ming-ching degree. Early in the

following year [+759], the Chief Administrator of the Left Imperial Guard, Wang Shu, memorialized to the throne, requesting that the selection of personnel in the field of medicine be done by examination in accordance with [the rules already in use for] the Ming-fa degree. From that time until now there have been State examinations in the Medical Classics, Therapeutics and various techniques, altogether ten papers (*tao*). These are as follows: *Pên Tshao* (Materia Medica) 2 papers; *Mo Ching* (Sphymology) 2 papers; *Su Wên* (Basic Medical Theory) 10 papers; *Shang Han* (Febrile Diseases) 2 papers; Miscellaneous branches of Medicine, 2 papers. Those who succeed in seven or more out of the ten compulsory papers are qualified, and the remaining candidates fail and are sent home. He (Wang Shu) also asked that [the examinations for the personnel of] the Bureau of Nutrition and the Bureau of Medical Services within the Palace should be like those of the Bureau of the Catering Service of the Crown Prince; and that those under the National Medical Administration (Thai I Shu) should be similar to those under the Imperial Bureau of Music (Thai Yo Shu).'

This very interesting passage requires a little commentary. The Tang dynasty established six special degrees in the selection of talented scholars for the administration. The first of these (Hsiu-tshai) was the basic degree, but besides that there were five others: Ming-ching for classical studies involving textual interpretations of the rituals and institutions; Chin-shih, primarily literary; Ming-fa to do with statutes, regulations, administrative technology and jurisprudence; Shu on calligraphy and history; and Suan for mathematics. It is quite interesting that the type of degree to be awarded for medicine should change from the Ming-ching to the Ming-fa. Could this indicate, one wonders, that the types of learning with which physicians were concerned were regarded as more relevant to the interpretation of natural regularities (like the fixed system of human law) than to philological criticism?¹ For the Ming-fa degree, 80% correct answers were required for 1st Class. We find also that there was a total of 18 papers in the medical examination, of which 10 were compulsory, and passing in at least 7 necessary for qualification. The final remark about the Imperial Bureau of Music explains itself when one looks at the regulations for that organization. There it appears that the professors themselves were periodically examined, as well as the executive musicians and acoustics experts, so that Wang Shu was presumably asking for a periodical test of the learning and efficiency of the teachers themselves. It does not look as though the trials of the embryo medical officers ended with the passing of their written examinations, for elsewhere in the *Hsin Thang Shu* we read:

¹On the relation between human law and the laws of Nature much will be found in SCC, 2, pp 518 ff

'As for the sons and advanced students of famous physicians, they get clinical experience and test their therapeutic skill under the supervision of high-ranking [medical] officers (Chhang Kuan) for three years. The names of those who succeed in this probationary practice then go forward [to the Government].'

We gain further insight into the Thang system of medical education by following the institution of provincial colleges of medicine. As early as +629, an imperial edict decreed that in every important provincial city (*chou*) of the country, a Medical College (I-Hsüeh) with a Professor of Medicine (I Po-Shih) was to be established. In +723 a further imperial edict added Lecturers (Chu-Chiao) to the Professors in the provinces. At the same time it was ordered that pharmacopœias (*Pên Tshao*) and certain medical books, especially one entitled *Pai I Chi Yen Fang*,¹ should be kept in all these colleges alongside the classics and histories. In the same year the *Kuang Chi Fang* (General Formulary of Prescriptions), composed by the emperor Hsüan Tsung himself, was published and sent out to each of the provincial medical schools. Some of the prescriptions in this work of an imperial pharmacist were actually written on notice-boards at cross-roads so that the masses could take advantage of them.² By +739 it was the law that every provincial city (*chou*) with more than 100,000 families was to have 20 medical students (I Sêng) and those of less than 100,000 were to have 12. In subsequent years the numbers of professors and students was increased. In +796 the emperor Tê Tsung published throughout the country his *Chen-Yuan Kuang Li Fang* (Valuable Prescriptions of the Chen-Yuan Emperor). In the same year an imperial edict ran as follows:

'Early during the Chen-Kuan reign period (+629) professorships of medicine (I Po-Shih) were established in all parts of the country. By the Khai-Yuan reign period (+723) additional posts of lecturers (Chu-Chiao) were added. They held examinations regularly for scholars on medical subjects and expounded the proper organization of rounds of medical visits within the area.'

The emperor now observing that the system had not developed as it should have done

'ordered that henceforth every large city (*chou*) must re-establish the medical professorship [for a properly qualified man], and all chief administrators (Chhang Shih) are required to give personal attention to the search for candidates to sit for examinations, and then select the best qualified for the posts [of medical officer]. Those already examined and qualified need not be examined again.'

¹Probably the same as the *Chou Hou Pai I Fang* (Handbook of Medicine) by the famous alchemist-physician Ko Hung, c +300

²This was remarked upon by the Arabic traveller Sulaimān al-Tājir, who was in China in +851

All this has a considerable bearing on our view of the date of foundation of the first Imperial Medical College. Since the provincial medical colleges were initiated as early as +629, it is clear that the central medical college must have been functioning within the first decade of the foundation of the dynasty, i.e. from +618. As we have seen, the institution was duplicated in Japan from +702 onwards.

For reasons which will be clear in a moment we do not propose to follow much further here the subsequent developments of the medical administration and its examinations during the dynasty of the Sung (+960 to +1280), the Yuan (Mongol) dynasty (+1280 to +1368), the Ming (+1368 to +1644) or the Chhing (+1644 to +1911). We have already said enough to establish the point we wish to make in this paper. However, something may usefully be said of the situation in the Sung.

The main educational work was carried on by the Imperial Medical College (Thai I Chū) which had reached its definitive form in +1076 during the premiership of the enlightened Wang An-Shih. Under the Director (Thai I Ling) and Deputy Director (Thai I Chhêng) there were a number of Professors and Lecturers, teaching no less than 300 students (I Sêng) in a number of specialties.

In this connexion it is most interesting to see the further growth of an important development, the examination of medical students in general literature and the philosophical classics. We noted the beginnings of this already in the Thang, as early as +758 (p 67). In Hangehow from about +1140 onwards the candidates were expected to pass examinations in the literary and philosophical classics as well as medical subjects. The imperial decree of +1188 ordered that unqualified medical practitioners must pass provincial examinations which included the general classical writings as well as sphygmology and other medical techniques. Anyone who did really well could gain an opportunity of rising to the ranks of the Han-lin Medical Academicians. This change was of great importance, for it ensured the existence of considerable numbers of physicians well educated in the classical literature and with greater general culture than their predecessors had possessed. Such men were called *ju i* (lit. Confucian physicians) as opposed to *yung i*, common practitioners, and *chhuan i*, wandering medical pedlars. Whether this was entirely a gain may be questioned, for a new race of men appeared who were very well educated but lacked perhaps practical experience which some of the rougher leeches of the past had had. Such was the situation at the end of the +12th century.

A well-known physician, Ho Ta-Jen, who pub-

lished in +1216 an important treatise on pædiatrics, preserved for posterity at least two important collections bearing on our subject. One was entitled *Thai I Chũ Chu Kho Chhêng Wên Ko* (Miscellaneous Records of the Imperial Medical College) and the other *Thai I Chũ I-Sêng Fu Shih Wên Ta* (Questions and Answers in the Examination Papers of the Imperial Medical College). These texts, though still extant, are rare, and we have not seen them.

Although the *Sung Shih* history gives prominence to three main divisions in medical education, other texts show that there were more elaborate classifications into six and nine. The latter, which became particularly well known in later times, is given in the *Yuan-Fêng Pei Tui*, together with the number of students following each course, as follows:

- (1) Internal and general medicine (*ta fang mo kho*) with 120 students.
- (2) Convulsive and paralytic diseases (*fêng kho*) with 80 students.
- (3) Pædiatrics (*hsiao fang mo kho*) with 20 students.
- (4) Ophthalmology (*yen kho*) with 20 students.
- (5) External medicine (*chhuang chung chien chē yang kho*) with 20 students.
- (6) Gynæcology and obstetrics (*chhan kho*) with 10 students.
- (7) Stomatology, dentistry and laryngology (*khou chhih yen hou kho*) with 10 students.
- (8) Acupuncture (*chen chiu kho*) with 10 students.
- (9) The treatment of war wounds and the use of apotropaics (*chin tsu chien shu chin kho*) with 10 students.

It will be seen that the total number of students amounts to three hundred. It is interesting to note that in our own time the examinations in traditional medicine currently in use in China follow much the same division into categories, with the addition of physiotherapy and history of medicine.

During the Sung period the Imperial Medical College was housed in spacious buildings. This can be seen from the *Sung Shih* history which, however, just falls short of telling us whether the College of the Northern Sung was fully residential, though the use of the term 'Hall' for the student bodies of the various years suggests that it was. After the fall of Khaifêng to the Chin Tartars in +1126, and the setting up of the new Southern Sung capital at Hangchow, the residential aspect of the organization comes into greater prominence, for the *Mêng Liang Lu* has much to say of the elaborate buildings provided in that city for the Imperial Colleges. The Medical College had lecture-halls for the teaching of the 4 Professors, and a temple for the worship of the tutelary deities of medicine; while the 250 students, who got excellent food in the refectory,

were accommodated in 8 'Study-Houses' (*chai shê*), the very names of which have come down to us. They were all equipped with a special cap and belt which distinguished them from ordinary citizens, but they had to face examinations every month and every quarter. Such was the state of the Imperial Medical College about +1275, when Marco Polo was on his way to China.

It will have been noticed that we have run over the centuries which corresponded to the rise and fall of the School of Salerno. This famous seed-bed of Western European medicine began in the +9th century when the Thang dynasty was drawing to its close. It reached its apogee in the +12th century during the highly cultured period of the Southern Sung after the fall of the capital, and it continued until the end of the +14th, which would take us to the close of the Yuan (Mongol) period in China. It appears that Arabic influence in Salernitan medicine is not to be detected much before +1050, but after that it becomes extremely strong, with the *Antidotarium* of about +1080. That was the time of Constantine the African, after which a massive transmission of Arabic knowledge and practice occurred, culminating in the *De Aegritudinem Curatione* of the +12th century.

We now approach the dénouement of this paper. The pattern of general education without vocational trend, followed by a course of theoretical medical study, and a year or two of practice under supervision, was foreshadowed in Europe as far back as +1224 in an edict of the Emperor Frederick II, which held good for Sicily, South Italy and Germany. Medical students at the School of Salerno were required first to study the logical treatises of Aristotle for three years and then to learn medicine from the books of Hippocrates, Galen and Avicenna for five years, finally carrying on clinical practice for one year under an experienced physician. The candidate was eventually subjected to a searching examination on the works of the Greeks and the Arabs, thereby obtaining a licence and graduating as *Doctor medicinae*, a term which originated in Salerno. The edict of Frederick II was apparently not quite the first of this kind, for in +1140 Roger of Sicily had decreed laws concerning State examinations for physicians. Moreover, examinations for surgeons appeared first in Paris at the Collège de St Côme in +1210. After the +13th century the monopoly of Salerno declined with the rise of the Schools of Montpellier, Paris and Bologna. We hear also of medical examinations among the Arabs in Cairo in +1283 and it is almost certain that the examinations and the licensing of Western Europe were borrowed from Arabic practice.

The year +931 constitutes a focal point in this matter. As a result of a death occurring through

the mistake of a medical practitioner, the Caliph al-Muqtadir placed an eminent physician, Sinān ibn Thābit ibn Qurrāh (c +880 to c +942), in charge of medical examinations for all existing practitioners and students. Sinān was the son of the great astronomer and mathematician, Thābit ibn Qurrāh (+825 to +901) and the decree which he received was personally written out by the Caliph himself. Sinān proceeded therefore to examine all those who came before him, passing 860 practitioners, both old and new, in the first year. The examinations were continued by his son Abū Ishāq Ibrāhīm ibn Qurrāh (+908 to +947), and there is reason to think that similar tests continued regularly in Egypt, if not in Persia, until the end of the Caliphate and afterwards. By +980 there was a large new hospital in Baghdad¹ founded by the Buwayhid Emir, 'Adud al-Dawlah, where twenty-five physicians taught, examining pupils and attesting to their proficiency. In view of all that we have found concerning the long history of Chinese medical examinations, we cannot but ask ourselves whether some influence from further East could have initiated the important development in Baghdad in +931.

There is indeed evidence that contacts existed between the Arabs of Iraq and the Chinese at least from the beginning of the +8th century. After the Battle of the Talas River in +751, which marked the farthest limit of Islamic expansion eastwards, many Chinese artisans settled in Baghdad, including paper-makers and metal-workers, and it would even be surprising if there were not physicians among them. Some prisoners returned home in Chinese ships from the Gulf in +762 but many remained and founded families in Baghdad. Then, to say nothing of a mass of other material which exists on Chinese-Arab contacts, we have, just at the moment we need it, evidence of medical contacts between the two civilizations. In the *Fihrist al-'Ulūm* (Index of the Sciences), by the famous author Abū'l-Faraj al-Warrāq, there is a story concerning the great Rhazes, perhaps the greatest physician and alchemist of his time (Muhammad ibn Zakariyā al-Razī, +850 to +925, or even +932). This story concerns his friendship with a Chinese physician, who asked him to read Galen aloud as fast as he could while the Chinese translated rapidly and took down notes or whole passages verbatim in the shorthand script known as 'grass-writing.' This glimpse of Arabic-Chinese contact provides exactly the bridge

that we need, and it is very easy to imagine that one or other of al-Razī's Chinese medical friends suggested to him that periodical examinations should be held, as they were in China, by means of which the fitness of young physicians could be tested.¹ It would seem that the Arabs took up this suggestion with energy and enthusiasm, handing on the torch of public safety and medical self-respect to the Western world.

Thus it is clear, to summarize, that examinations of proficiency were held in China from -165 onwards; the Imperial University was founded in -124; Regius professorships and lectureships in medicine, implying examinations for qualification, date from +493; an Imperial Medical College and provincial medical colleges were established between +620 and +630; and medical degrees were awarded from then onwards. In the light of all that we now know, we are able to estimate at its true worth the opinion of John Barrow, who wrote in 1804: 'The Chinese . . . pay little respect to the therapeutick art. They have established no public schools for the study of medicine, nor does the pursuit of it lead to honours, rank or fortune.'

BIBLIOGRAPHY

- Ball W W R
(1889) *A History of Mathematics at Cambridge*. Cambridge
Barrow J (1804) *Travels in China*. London
Bazin M (1858) *J. asiat.* Ser. 5, 8, 393
Biot E (1851) *Le Tchouou Li*. Paris
Castiglioni A (1947) *A History of Medicine*. New York
Chhen Pang-Hsien (1957) *Chung-Kuo I-Hsieh Shih* (History of Chinese Medicine). Shanghai
Dubs H H (1938-1955) *The History of the Former Han Dynasty*. Baltimore
Elgood C (1951) *A Medical History of Persia and the Eastern Caliphate . . . Cambridge*
Fujikawa Yu (1911) *Geschichte der Medizin in Japan*. Tokyo
Galt H S (1951) *A History of Chinese Educational Institutions*. London
Gernet J (1959) *La Vie Quotidienne en Chine à la Veille de l'Invasion Mongole*. Paris
Greenwood M (1942) *Biometrika* 32, 101, 203
Harper R (1904) *The Code of Hammurabi, King of Babylon*. Chicago
Iskandar A Z (1962) *Bull. Hist. Med.* 36, 362
Lecomte L (1698) *Memoirs and Observations . . . made in a late journey through the Empire of China . . . London*
Li Thao
(1953) *Chin. med. J.* 71, 301
(1954) *Chin. med. J.* 72, 65, 225
Lu G D & Needham J (1951) *Isis* 42, 13
Mettler C C (1947) *History of Medicine*. Philadelphia
Needham J *et al.*
(1954-) *Science and Civilisation in China*. Cambridge
des Rotours R
(1932) *Le Traité des Examens, traduit de la Nouvelle Histoire des Thang*. Paris
(1947) *Traité des Fonctionnaires et Traité de l'Armée, traduits de la Nouvelle Histoire des Thang*. Leiden
T'eng Ssu-Yü (1943) *Harv. J. asiat. Stud.* 7, 267

¹The background of all the Islamic hospitals and medical education was the great Sassanid medical school of Gundī-shapur (Jundī-Shāpūr) founded in the +5th century. It enjoyed the continuance of the Greek tradition because it absorbed the medical school of the University of Edessa (founded by Seleucus Nicator in -304) when that was closed by the emperor Zeno in +489; but it also drew abundantly from Indian, and later Chinese, sources, because Nestorian Christianity was its dominant faith

¹Very recently, Iskandar has discovered at Alexandria a remarkable Arabic MS of a text 'On Examining Physicians' attributed to Galen, and quoted as such by al-Razī himself in a tractate with the same title. It remains to be seen how reliable this attribution is, but at least the text must be contemporary with al-Razī or somewhat earlier. In any case it does not deal exactly with qualifying examinations, but rather with the selection of physicians for important responsibilities from medical men already practising